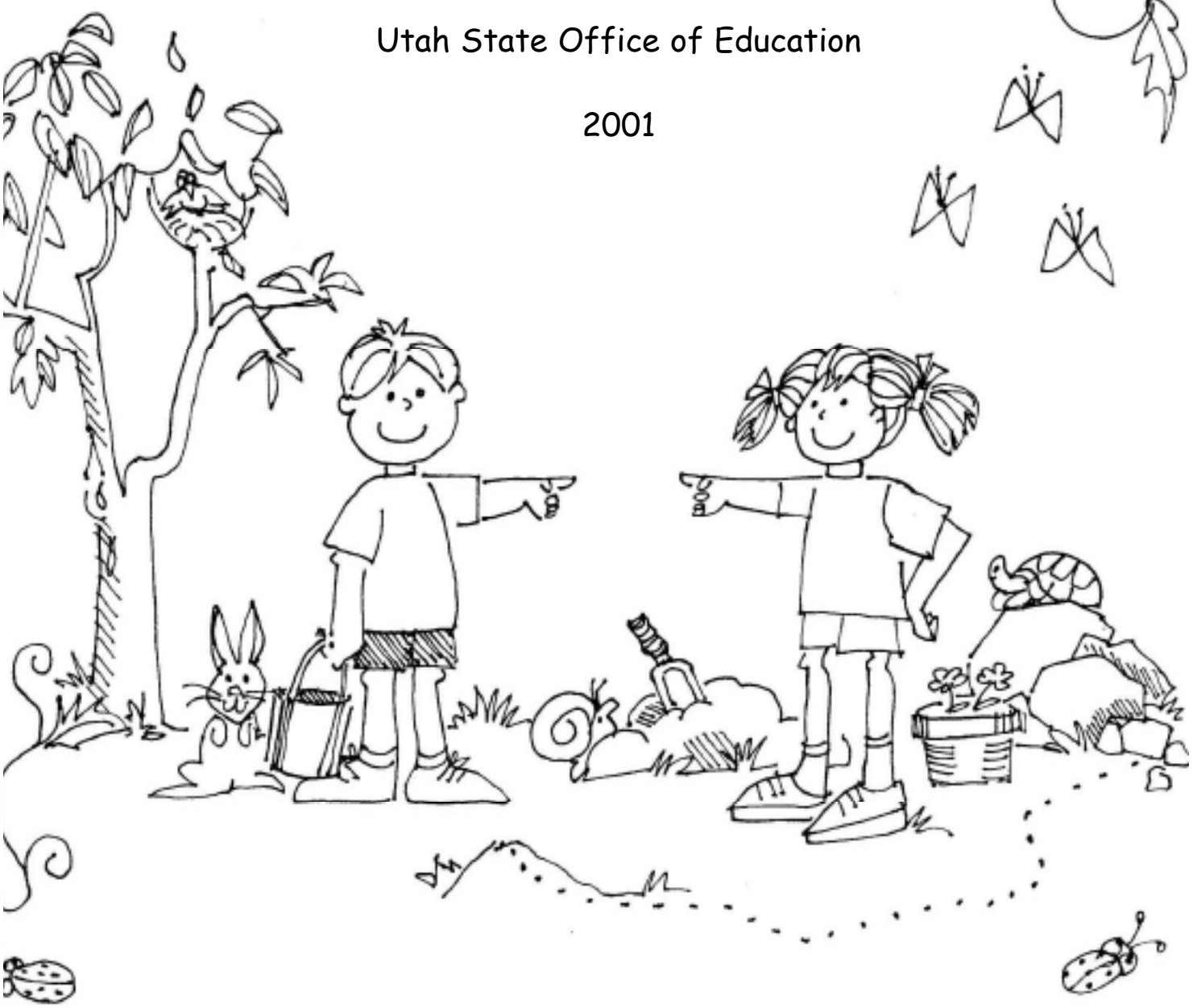
The Young Naturalist
For Fourth Graders

Utah State Office of Education

2001



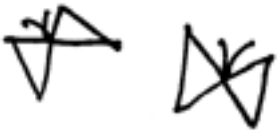
This Book Belongs To:

_____

What's A Naturalist?

Do you like looking under rocks,

chasing butterflies,

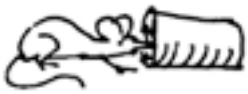


or just watching the clouds pass by?

A naturalist is someone who likes to watch and study nature.

Naturalists:

are curious,



watch and observe,

ask questions,

take notes,

read about the subject,

make guesses,

do experiments, and

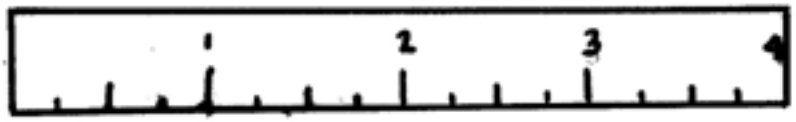
draw conclusions.

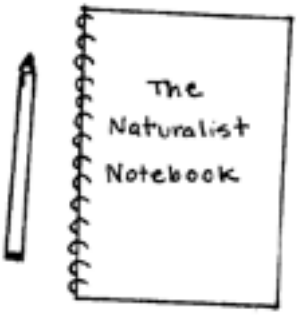
You can be a naturalist too!

Exploring

Explore one area through the seasons and you will find clue after clue about how nature works. Put all the clues together and you will be able to figure out how living things all over the Earth are connected.

This book is about discovering what's happening in the natural world around you. As you investigate a spot, some tools will come in handy. With a **magnifying glass**, you will enter the world of the tiny. With a **small shovel** or trowel, you can dig for clues hidden underground. A **measuring tape** will be handy to find out how big or little things are. Cut a square out of a piece of paper to make a **square window** that you can observe things through. Always carry your **notebook** and a **pencil** so you can write down and draw pictures of what you find. Good Luck and Have Fun!

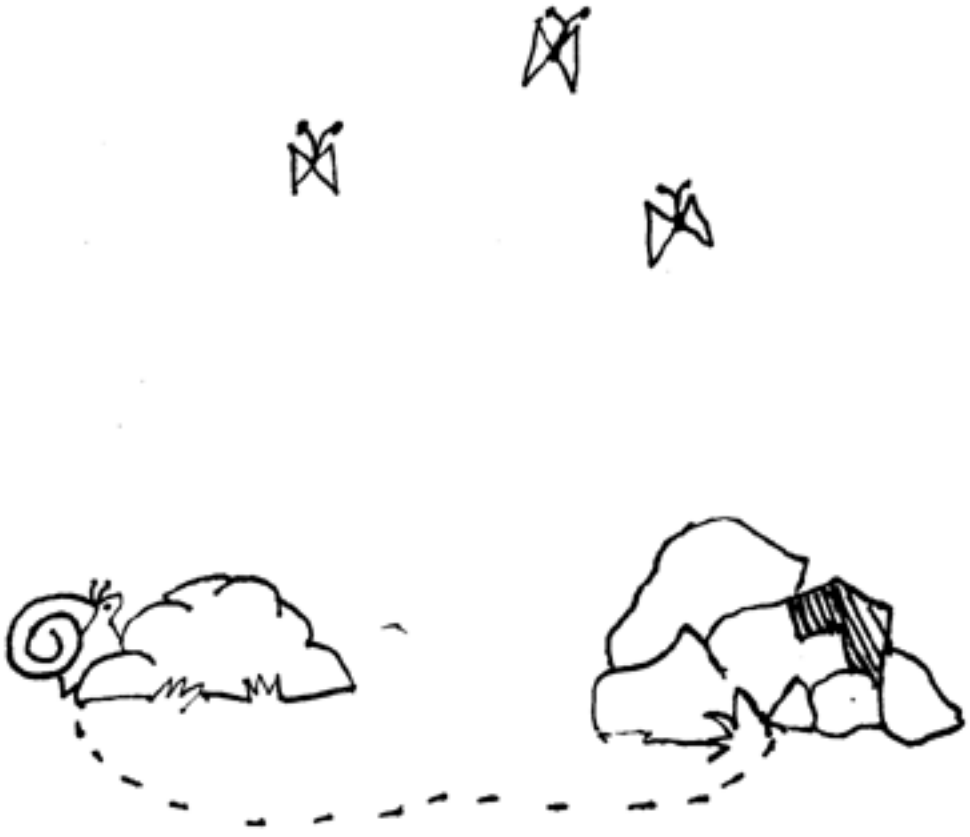




Finding Your Special Place

Look for a special place that you really like. It might have lots of sun, a big tree, or a nice view. You will be spending a lot of time at your special place. Look for a spot that feels good to you and that you will want to explore. Your spot may be in a natural area nearby, a city park, or even your own backyard. It might have plants, rocks, and dirt. Maybe birds and other animals live nearby.

You will come to this place many times to observe and investigate the weather, animals, plants, rocks, and soil. You will need to be able to find your spot again. To do this, make a map of your spot and where it is. Include any obvious landmarks such as a tree, building, or sidewalk crack. Use the following page to draw a map of your spot and how to find it.



Map of My Special Spot

Daily Observations

Take the first few minutes of your visit to your site to make some simple observations. Record these every time you come to your site.

 Date:

 Time:

Place:

 Weather:

Do you notice anything interesting today?

Getting To Know Your Site

Naturalists explore and learn about their surroundings through observation, or watching carefully. It is lots of fun to explore using all of the body's senses. In this activity, use your hearing, touch, and smell, as well as sight to make new discoveries about the world around you.

Close your eyes for a minute. Listen to the sounds around you. How long does it take you to hear five different sounds? Try to identify what is making the sounds. List them here.

1_____
2_____
3_____
4_____
5_____

Close your eyes. What can you smell? Find two different smells at your site and describe them. Where do they come from?

1)

2)

Use your hands to find the warmest and coldest places in your spot. How might these change during the day and night?

Warmest Place(s):

Coldest Place(s):

Close your eyes again. What can you feel? Can you feel the ground, the rocks, or grass. Is the wind blowing or is the sun on your back? Describe your observations in words or a drawing.

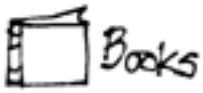
Close your eyes one more time. Turn in a circle and then open your eyes. What was the very first thing you saw?

Can you identify it? Describe what you see.

One of the things naturalists do is ask questions about the things they see. Have you ever wondered about something related to what you see? Think of a question and write it down.

Take a guess at what the answer might be.

Find out the answer to your question. The library, a computer, or your teacher are good places to start. Write the answer here.



Use this space to draw what you first you saw.

Water On The Move

Place a glass jar over some grass at your site. Wait and watch as water drops build on the sides of the jar. This is called **condensation**. Answer these questions and record any other observations you made.

1) Where did the water come from?

2) Where would the water normally go if the jar wasn't there to catch it?

3) What happens if the jar is placed in the shade?

4) What happens if the jar is placed over dirt?

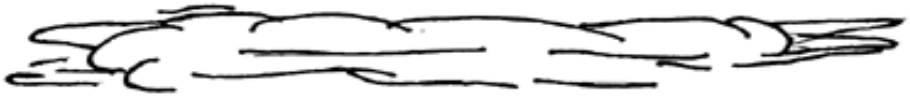
Cloud Wizards

Look up into the sky. Are there any clouds over your site? What do they look like? Do they remind you of anything? One way clouds are grouped is by the way they look. Have you ever seen **cumulus** clouds which look like piled-up heaps of cotton, or **stratus** clouds which are low, layered clouds that cover the sky like a blanket? **Cirrus** clouds are wispy curls high in the atmosphere.

You can watch clouds move and change. Lie on your back and look up to the sky. Record your cloud observations. Describe what the clouds look like - the shapes, colors, and movements. There may be more than one cloud type in the sky at once. Use any extra space to draw the clouds you observe.

Cirrus

Cumulus



Stratus

Cloud Observation

Date:

Time:

Location:

Cloud Type:

Description:

Cloud Collage

Use this space to make a collage of all different clouds. You can use photos, magazine clippings, drawings, or anything else you can think of.

Air On The Move

Can you see air? No, but you can see air moving things as wind. A windy day is great for flying kites, sailing boats, scattering seeds, and spinning pinwheels. Sometimes the wind goes wild, knocking over trees or blowing down buildings. All of these winds are nothing more than air on the move. Sit quietly in your spot for at least five minutes. Observe and feel the air moving around you. You may want to close your eyes to feel the wind better. Then record your observations.

Is the air moving around you?

How strong is it blowing?

From what direction is it blowing? (coming from your back, your front, your right or left side?)

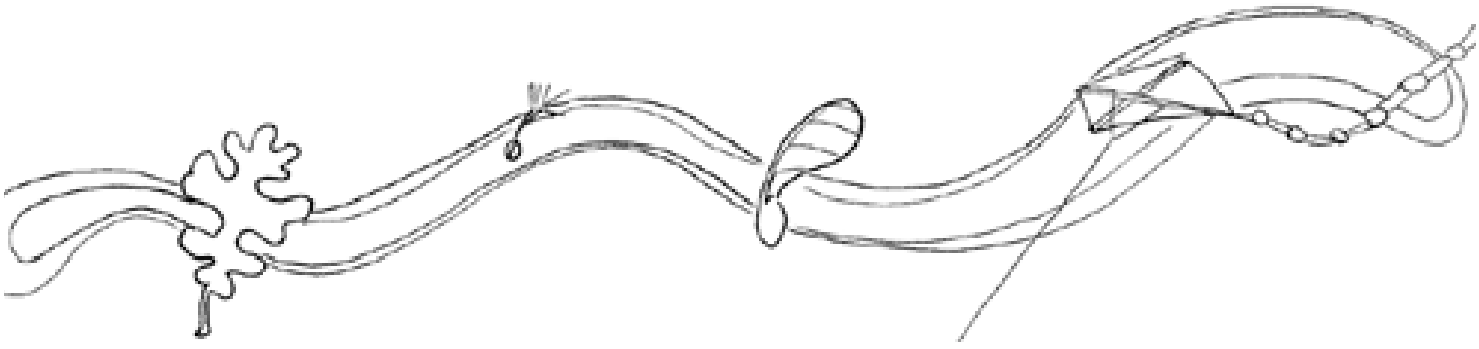
Look around you. List four things being moved by the wind

1)

2)

3)

4)



List five ways people use wind.

1)

2)

3)

4)

5)

Record other observations you made today about wind.

Windblown Poetry

The wind is a wonderful subject for poetry. You can capture your thoughts and feelings about wind by writing your own wind poem. Make a list of all the words you can think of that describe the qualities of the wind.

Here are a few words to start off:

dancing bitter violent

A haiku is a Japanese form of poetry with three lines. The first line has five syllables, the second line has seven, and the third line has five again. One idea behind a haiku is that it captures the writer's first reaction to something in nature. Look for the syllables in the haiku poem below.

1 2 3 4 5
In the calming touch
Of summer's breeze....warm and soft
My sleepy eyes close

Use this space for your own windblown poetry

Weather Scavenger Hunt

Search for these weather related clues. In this scavenger hunt, you don't have to collect anything. Just check off each item found and write a description or draw a picture of what it was. You do not have to find everything on the list, but search for as many as you can.

- something bending toward the sun

- something hiding from sunshine

- something that tells you the wind is blowing

- something left by rain

- a place that gets little sunshine

- a bad place to seek shelter during a lightning storm

- a place where rain has moved soil

- something that bends in the wind

- something that won't bend in the wind

- something that reflects lots of sunlight

- something that absorbs lots of sunlight

- something that will soak up rain

- something that makes rain splatter

- someplace to go where it is cool

Rock and Mineral Laboratory

What could be harder and more permanent than rocks? Rocks are part of a never-ending cycle of formation and destruction. They are made and then torn apart, put together, crushed, folded, and melted over again.

All rocks can be divided into three main groups - igneous, sedimentary, and metamorphic rocks - according to the way in which they were formed.

Igneous rocks start off deep within the earth as magma, or molten rock. The magma rises toward the surface where it erupts from volcanic vents or cools and solidifies within the earth's surface. How quickly or slowly the magma cools, dictates how rough it feels and any crystals that form in the rock. Many of the most familiar rocks are **sedimentary** rocks. These form as sand, mud, or other small rock particles settle in layers and then harden over thousands of years. The word metamorphic means changed and that is what these rocks are. **Metamorphic** rocks form when igneous or sedimentary rocks are subjected to high temperatures or crushed by huge pressures underground. All rocks can be sorted into these three groups by the way they look.

Rock Test #1

Find three rocks at your site. Place your square window over the rock. Use your hand lens and other senses to explore and record what you see through the square.

Location where you found the first rock:

What colors can you see?

What's its shine? (ways to describe shine include dull, pearly, glassy, or metallic)

How hard is it? Can you scratch it with your fingernail?

With a penny?

With a steel nail?

How does it smell when it is dry?

How does it smell when it is wet?

Draw the small section you can see through your square window.

Look at your rock through the hand lens again. What do you see? List five things that this reminds you of.

1)

2)

3)

4)

5)

Why do you think these things are like this? List five ideas you can think of.

1)

2)

3)

4)

5)

Rock Test #2

Find another rock that you find interesting that is not at your site. Do your own investigation. Use the next two pages to write down what you find. Don't forget to use all of your senses.

Rock Test #2 -continued

Rock Test #2 -continued

More than Just Dirt

Soil is one of our most useful natural resources. From soil we get food, clothing, and materials for the houses we live in. What grows at your site depends on what is in the soil. Dig down in your site and scoop a handful of soil. It took hundreds, perhaps thousands of years for the rocks to be broken down into the bits of sand, silt, and clay that you are holding.

The different ways nature does this is called **weathering**. Try to find tree roots growing out of cracks in rocks. The roots are breaking the rocks open by widening the cracks as they grow. This is weathering. Fill an ice tray with water and let it freeze. In the same way that water expands in the tray when it forms ice, water filling cracks in rocks expands and pushes cracks open farther. Over time, with repeated freezing and melting, the cracks get bigger until the rocks break. This is weathering too. Conduct a soil test in two different locations, one at your site and at another place you choose. At each location, dig a small bit of soil onto a sheet of paper. Use all your senses to investigate your soil sample. Record your observations on the following pages.

Soil Observation #1

Location:

Is the soil moist or dry?

Color of soil:

Does the soil have leaves or other organic matter in it?

Does the soil have rocks in it?

How big or small are they?

What does the soil smell like?

Does the soil have anything in it that doesn't belong, like trash?

Does the soil have bugs or other living things in it?

Record anything else you observe in the soil.

Soil Observation #2

Find another place that is not at your site and do your own soil observation. Use the next page to write down what you find.

Soil Observation #2 -continued

John Muir

No one bought nature to life like John Muir. His great love for all living things gave him a rare understanding of the natural world. Birds, bears, and flowers all revealed their secret lives to him. When Muir spoke of his encounters with wild animals, trees, and mountain storms, his listeners said it felt as if they were there, experiencing the adventure with him. Muir also excelled at sharing nature through his writings. They are deeply beautiful, filled with wonder and joy for nature. It has been said that Muir was the only person who could turn a government report into poetry! A native of Scotland, Muir today is remembered as the father of America's national parks. Born in 1838, Muir is considered by many to be the most influential conservationist of modern times.

My Favorite Animals

by John Muir

Sierra travelers often complain about seeing few animals. "Trees," they say, "are fine, but where are the animals and birds? We haven't heard a song all day." And it's no wonder! They go in such large groups, make a great noise, and dress in such outlandish colors-no wonder animals avoid them. Even the frightened pines would run away if they could. But nature lovers, silent and open-eyed, looking and listening with love, find that animals come to them gladly.

One Sierra morning as I was eating breakfast in a small meadow surrounded by brush, I noticed a deer gazing at me. I kept still, and the deer came forward a step, then paused, snorted and quickly fled. But in a few minutes she returned, bringing along two friends. Staying for just a moment, they took off, too. But their curiosity brought them back once more-now with a fourth companion. This time, the deer were satisfied that I meant them no harm, and they settled down in the meadow and ate breakfast with me, just like tame, gentle sheep around a shepherd.

Another time, a whole troop of mountain quail visited me. They are our most handsome and largest quail. Small and stocky, they have a beautiful head plume, which they wear jauntily backwards like a feather in a boy's cap. These ground-dwelling birds are most secretive, and usually run from any threat, flying only if necessary. They wander the lonely mountains in family flocks of six to twenty, living high in the Sierra.. Only in winter do they come down to the brush foothills, but like every true mountaineer, they are quick to follow spring back up into the higher mountains.

I was sitting at the foot of a tree, sketching, when I heard a flock up the valley behind me. Their voices grew increasingly

louder, and I knew that they were feeding toward me. I kept very still, hoping to see them, and soon one came within three or four feet, not noticing me any more than if I were a stump or a tree. Along came another, and another, and I was thrilled to get so near a view of these handsome fellows so that I could observe their manners, and hear their low, peaceful notes.

One of them finally saw me. He gazed for a moment in silent wonder, then uttered a strange cry, which was followed immediately by hurried muttered notes that sounded like speech. The others saw me as soon as the alarm was sounded, and they joined in the wonder talk, gazing and chattering, astonished but not frightened. Then all together they ran back with the news to the rest of the flock. "What is it, what is it? Oh, you never saw the like," they seemed to be saying. "Where? Where?" "Down there by that tree." They approached cautiously, coming past the tree and stretching their necks, looking up in turn as if knowing from the story told them just where I sat. For fifteen or twenty minutes they kept coming and going, venturing within a few feet of me and discussing the wonder in charming chatter. Their curiosity at last satisfied, they began to scatter and feed again, returning in the direction they had come. Sorry to see them go, I followed them as quietly as I could, crawling beneath the bushes and keeping them in sight for an hour or two, learning their habits and finding out what seeds and berries they liked best.



What Habitat Is That?

There is diverse plant and animal life that adapts and interacts in Utah's wetland, forest, and desert habitats. These three habitats are defined by certain plants or physical characteristics. What kind of habitat is your special spot in?

List 6-10 characteristics of the habitat at your site. Look in all directions and stay close to your spot. Consider all the things that make up this area around you, plants, animals, soils, views, etc.

1)

2)

3)

4)

5)

6)

7)

8)

9)

10)

Take a guess at what kind of habitat this is.

Find two other natural places to observe that's not too close to your square meter. Try a forest, wetland, desert, or any other place you choose. List your location and 6-10 characteristics of this place.

Location:

1)

2)

3)

4)

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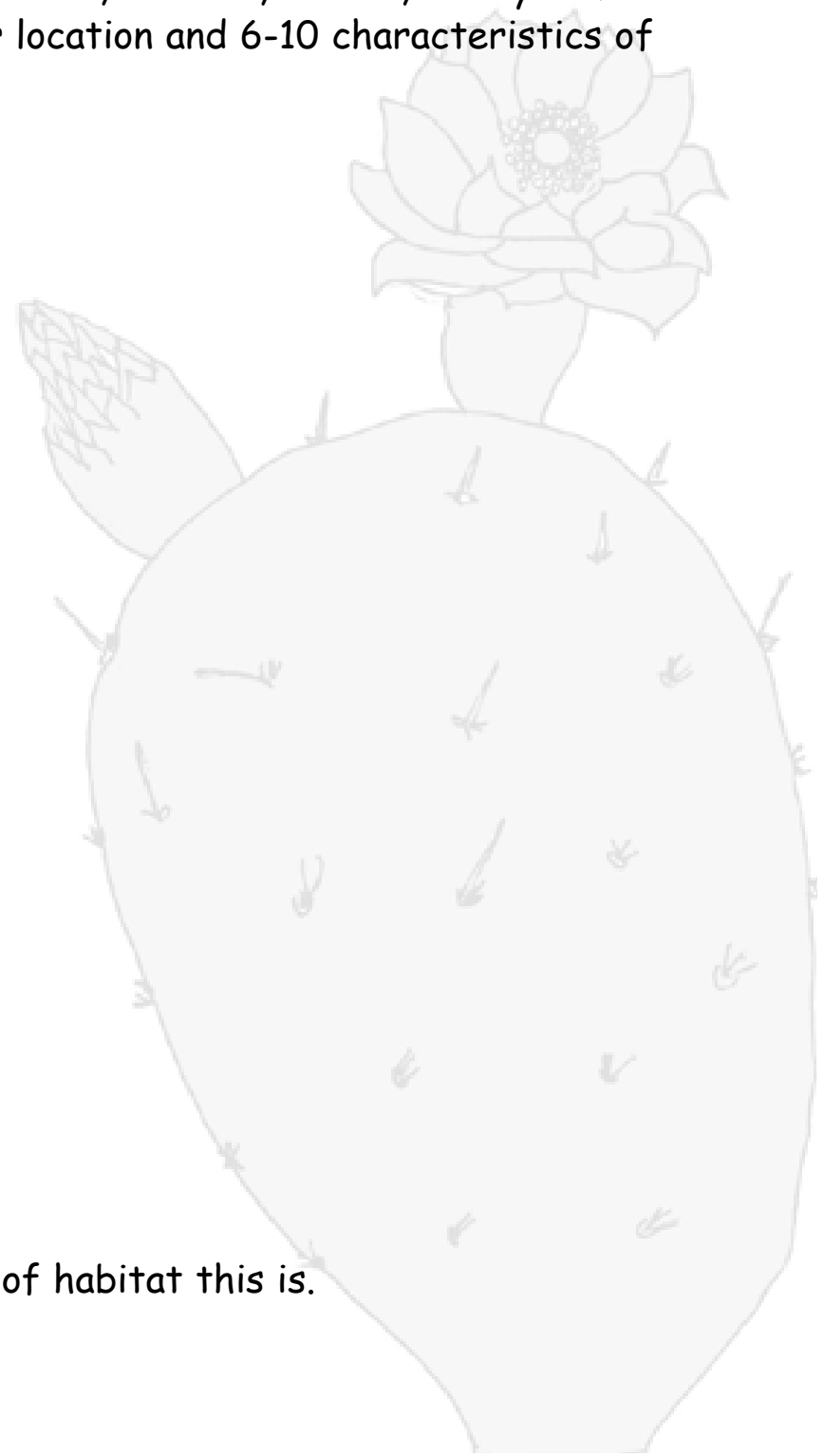
7)

8)

9)

10)

Take a guess at what kind of habitat this is.



Location:

1)

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6)

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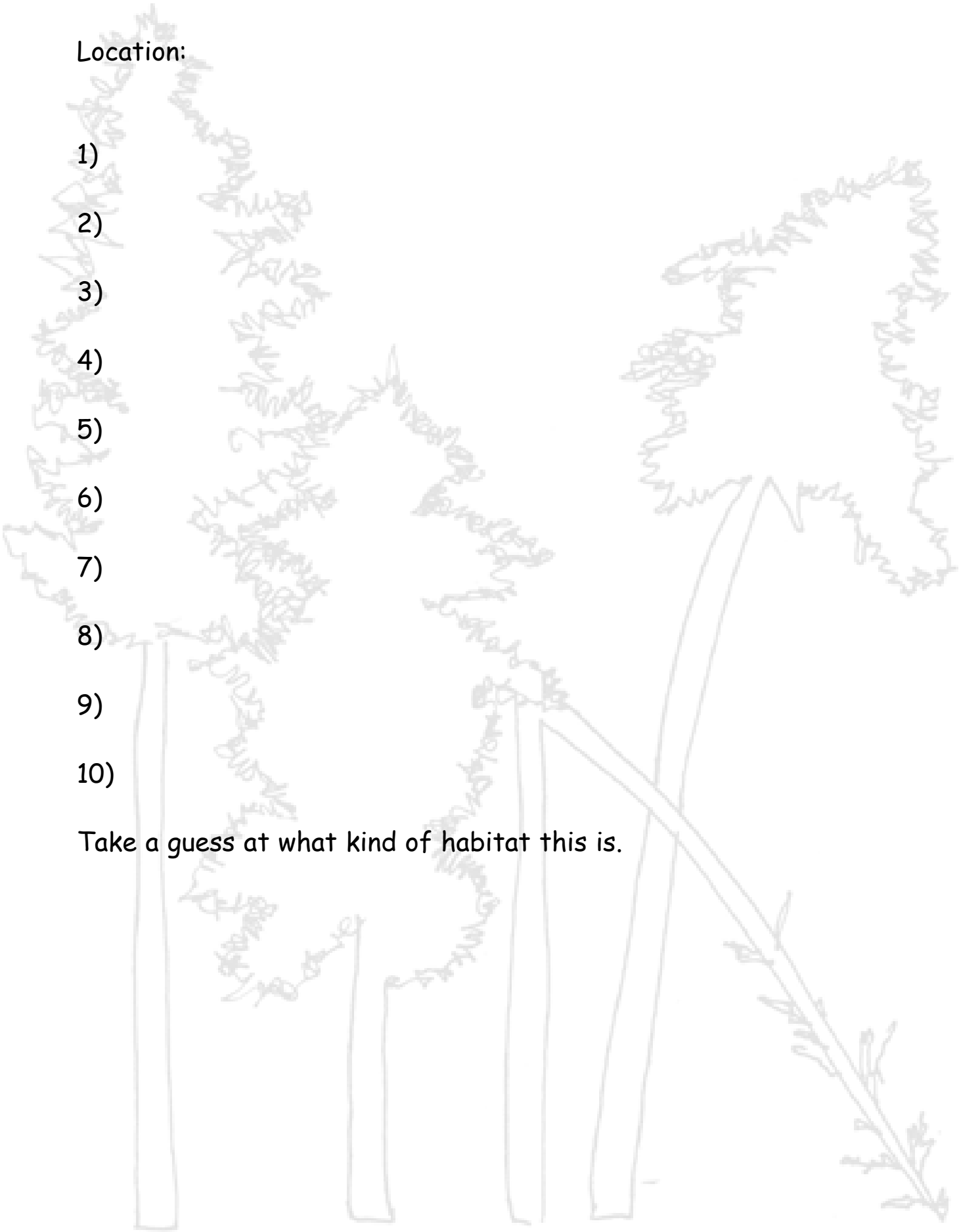
8)

9)

10)

Take a guess at what kind of habitat this is.



Deciduous Trees

Trees shade and cool our homes, bring songbirds close by, and mark the changing of seasons. They also provide food for humans and animals as well as many of the things we use. Also important, trees reduce soil erosion, clean the air we breathe and help keep our atmosphere in balance. Many of the trees we see are native to the Utah landscape while others were brought here by people.

Some trees lose their leaves every year in the fall. These are called **deciduous** trees. Find a deciduous tree on or near your site to observe and study.

1) Use this space for a drawing of your special tree.

2)Use a measuring tape to find the distance around the tree trunk. How big around is the tree at the height of your knees?

At the height of your shoulders?

3) Measure how long one leaf is. Measure from the tip of the leaf to the end of the stem.

4) Measure how wide one leaf is. Measure the distance from the widest edge of the leaf to the other edge.

5) Feel a leaf. What does it feel like?

6) What are all the colors can you see in the tree?

7) How are the leaves attached to the branches? Are they straight across from each other or are they staggered? Use this page to draw a branch with leaves.

8) How tall is the tree? Take a guess if you can't measure it.

9) Smell the tree. How does it smell?

10) Feel the bark. How does the bark feel?

11) Place your square window on the bark. Draw the patterns you observe in the bark through the window.

12) Are there any flowers, fruit, or anything else interesting on the tree (a nest, knot in the wood, thorns) Draw them here.

13) Use a field guide to identify the tree. What kind of tree is it?

Leaf Art

Find a leaf from the tree you have studied. Place it under this paper. Using a crayon on its side, rub over the leaf allowing the pattern of the leaf to come through. You can trade leaves with others to make a collage or pattern. Use the next page too if you need more space.

Conifers

Conifers are trees with needle like or scaly leaves. The needles stay on the trees year round, so they are often known as evergreens. Conifers produce seeds in cones. Find a conifer on or near your site to observe. Explore all the parts that make up the tree -the bark, cones, needles, or anything else you observe. Remember to use all your senses. Record your observations in both words and drawings.

Conifers-continued

Use this space for a close up sketch of the needles and cones of your conifer.

Still Hunting

Find a place to sit comfortably. If you can be hidden by a bush or a tree, great! Otherwise just find a place where you don't stand out too much. Sit still and quiet for at least ten minutes. As you sit quietly, look for insects, birds, or mammals

List what you saw:

_____
_____
_____
_____
_____

Choose one of the creatures you listed and see if you can answer the following questions:

What was it doing?

What were its colorings and markings?

How did it move? (fly, crawl, jump, run, etc.)

What does it eat?

Did it make any sounds? Describe the sounds.

Did it notice you?

What would it do if it rained?

Where does it live?

Write three of your own questions about the creature you saw.

Use this space for a drawing of the creature you saw:

Adaptations

Adaptations are ways in which living things cope with their environments. There are two main types of adaptations: physical and behavioral. Physical adaptations are physical features that help a plant or animal survive. The shape of a bird's beak, the color of a flower, or the changing color of fur on a mammal are all examples of physical adaptations. Behavioral adaptations are ways in which an animal behaves that help it survive. Behavioral adaptations include hibernating in the winter, migration, or feeding at certain times.

Can you think of a way that humans have adapted to living in the surrounding environment?

List five plants or animals you observe at your site. What adaptations might help them to survive?

Plant or Animal	Adaptation
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

A Rrripping Yarn

Why would anyone want to watch and observe nature in their own backyard? Well, ask George de Mestral. As a struggling inventor, he paid some attention to wildlife and today he is a rich man. George de Mestral found his inspiration in his native Switzerland, but the plant he got it from exists throughout the United States- in parks as well as in city lots and even in side-walks, where the paving has cracked. What's more, it is one of the few species that almost everyone knows. People touch it, they rip pieces of it off their clothing. They have been doing so for centuries. Yet no one else figured out what de Mestral figured out. Can you? It's a burdock plant.

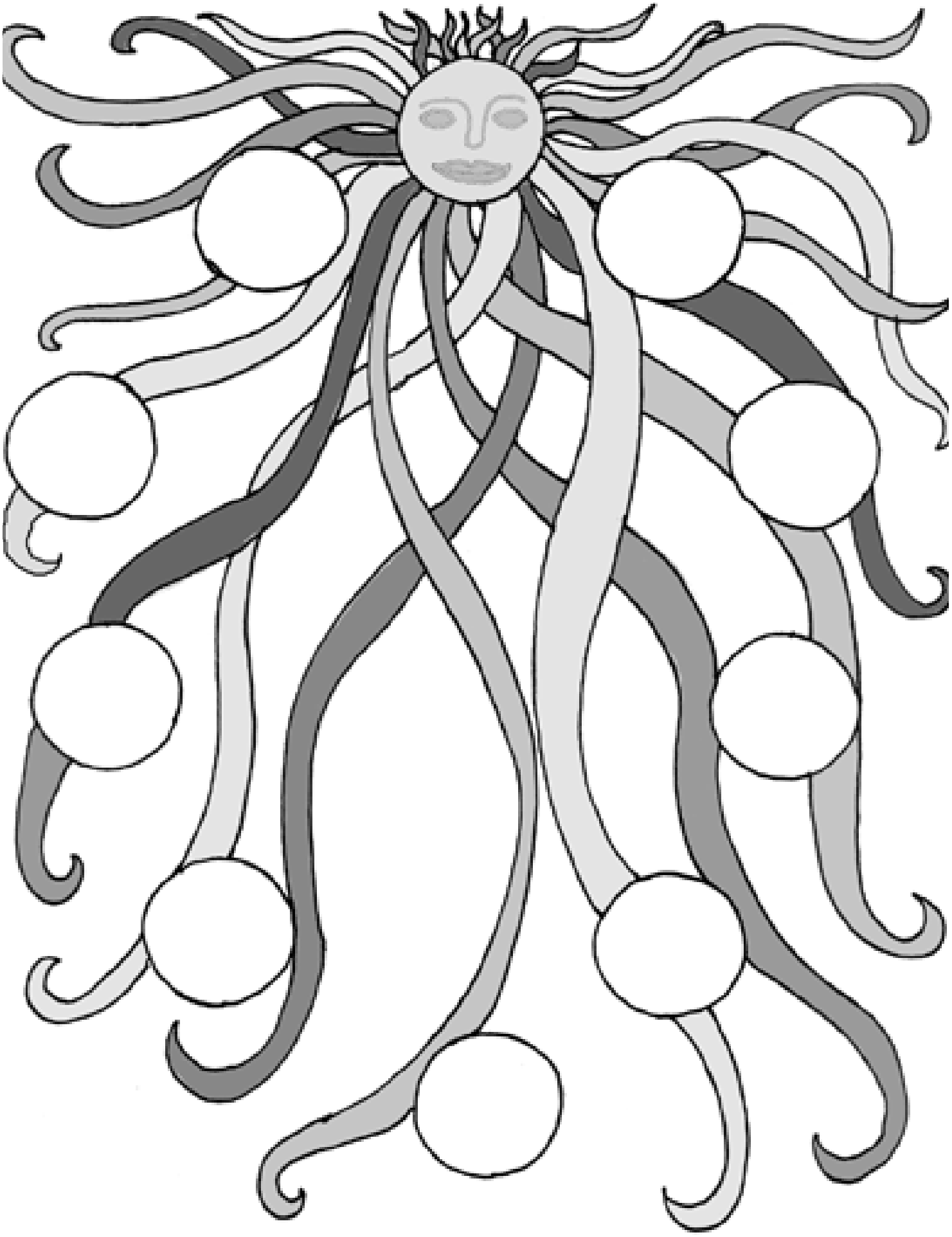
From mid-summer through mid-winter, the burdock's tall stalk bristles with those round, brownish objects we call "burrs". Examine some burrs. Think of comparisons as you press them against your sock, then rip them away. Rrrip! What does this rip-ping bring to mind? How about velcro?

When de Mestral examined burrs in 1948, he saw that each was a seed container covered by masses of tiny hooks. With these, the burr could latch onto fuzzy things, like your pants or the fur of an animal. But when de Mestral saw the hooks, he thought of a new use for them. He thought of a fastener. One half of the fas-tener would be lined with hooks, like those on a burr. The other half would hold matching loops. Today that fastener is a reality. You could probably put your hand on some Velcro right now. It holds together not only sneakers, but parts of cars and pieces of the space shuttle too. All because one person decided to look at the plant and animal life all around him.

The Web of Life

The animals, plants, rocks, and soil of a area form a community of living and non-living things that depend on each other. For example, a fallen tree is the perfect home for all kinds of creatures. As the tree decays, it gives vital nutrients to the soil for growing plants. Trees and plants are homes for all kinds of animals. Plants and animals die and become food for other plants and animals. Everything in nature is connected to the many other things, living and non-living, that are nearby.

Choose nine things from your site that you have seen or seen signs of. Write the name in each of the circles on the next page. Be sure to include some plants and animals and anything else you see, like seeds or even yourself. Pick one circle and draw a line from it to something that it influences or is influenced by. (For example, grass could connect to a robin because the robin uses grass to build its nest.) Then draw a line from that new circle to something it influences or is influenced by. Continue until everything is connected at least once (you may connect to some things many times). You have now drawn a web of life at your site. Pretend that one of the things you put in a circle has disappeared from the site. For example, a nearby tree is cut down, or a stream dries up. Cover that circle and follow its lines. Cover up anything that was connected to that circle. How many other things are affected by removing one thing?



The Poetry of Your Site

Writing a poem is a wonderful way to explore your site and to express your observations and feelings. Choose a nice place and sit for a few minutes just watching and enjoying. Notice the different sounds, movements, colors, and textures that exist in nature. Feel the special quality that each thing expresses. How does what you see make you feel? Try one of these forms of poetry or any other style you know.

Vertical Poem
Choose a word that captures the feeling of your spot. Use the letter of the word to begin each line of your poem. Here's an example by Marc from Reese Elementary.

The trees we see are big
Rustling in the breeze
Evergreens never lose their needles
Even in the winter when it's
Snowing big snowflakes

Write your own vertical poem.

___ _____
___ _____
___ _____
___ _____
___ _____
___ _____
___ _____
___ _____

List Poem

Take a stroll in the outside world jot down what you see and what is happening: birds, stone, squirrel. Notice such things and turn them into images: a blue bird pecking away, a squirrel sitting like a beggar, that stone, smiling, shaped like a biscuit. Use these images to create your poem. You may only find one or two good images which will help you to create a good list piece.

Here's another good way to work: jot down a question and then answer it. For example: Who else has breathed this air? The answers can become the list.

<u>River</u>

the young life of a cottonwood tree
pebbles cradled in rock
a spiral of sand on my skin
the half moon at dusk
horsetails curled between stones
the cry of a falcon
small bumps in the river of life

Care For Your Special Place

Something new is always happening in your special place. Day and night, season to season, year after year, change keeps taking place above and below the ground.

The more time you spend getting to know your spot, the more you will see nature in action. By figuring out how each living thing is fitted to survive where it does, how plants, animals, soil, and air are connected, and how nature provides for life to go on, you will deepen your understanding of why so many different kinds of creatures exist on this planet.

There are more than a million reasons for you to take care of your site and everyone of those reasons lives in it. Don't hurt anything on purpose. In this way you will be letting nature select which plants and animals live, which die, and which produce young. These are the same kinds of steps you can take in parks, on farms, and on mountains to help keep our planet healthy.

List three reasons for you to take care of your special place.